

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

26. (currently amended) A process for manufacturing a single part fibre-reinforced component having at least one closed or undercut hollow space, comprising the steps of:

manufacturing a shape-stable supporting core by plastic deformation from a shape-stable perform so as to create the hollow space in the fibre-reinforced component, the supporting core being shaped part that is meltable above room temperature, the manufacturing step including plastically shape-forming the supporting core out of a perform that is cast in a rough shape of a final supporting core shape, the perform having at least an equal mass with the supporting core being manufactured;

charging a mould with a cavity at least with fibre material and the supporting core;

injecting a flowable plastic matrix into the cavity of the mould using a Resin-Transfer-Molding (RTM) process thereby soaking the fibre material and forming a shaped fibre-composite mass;

hardening the fibre-composite mass thereby resulting in a fibre-reinforced component;

melting the supporting core out of the fibre-reinforced component when the component has reached a stable shape containing a closed or undercut hollow space; and, choosing the shape of the perform so that distances of the material has to flow during plastic shape-forming are minimized, an average temperature of the core during plastic deformation and an average temperature of the cure during injecting of the plastic matrix when producing the fibre-reinforced component being at least substantially equal, wherein an average temperature of the supporting core during the injection of the plastic matrix into the mold deviates by less than $\pm 6^{\circ}$ C from an average temperature of the core mass or perform during plastic deformation.

Claims 27-30 (canceled)

31. (previously presented) A process according to claim 26, wherein the perform has a greater mass than the supporting core.

32. (previously presented) A process according to claim, 26 including plastically shape-forming the core mass or the perform at an average temperature greater than 20°C and less than a melting temperature of the core mass or perform, whereby the melting temperature is above 50°C.

33.(previously presented) A process according to claims 32, including plastically shape-forming at an average temperature greater than 35°C.

34. (previously presented) A process according to claim 33, including plastically shape-forming at an average temperature greater than 50°C.

35. (previously presented) A process according to claim 26, wherein the supporting core manufacturing step includes manufacturing the supporting core to contain wax.

36. (previously presented) A process according to claim 35, wherein the wax is one of natural wax, chemically modified wax and synthetic wax.

37. (previously presented) A process according to claim 35, wherein the support core is comprised substantially of wax.

38. (previously presented) A process according to claim 32, wherein the core mass or perform has a melting temperature which is at least 75°C and at most 130°C, and the process including plastically forming the core mass or perform from a temperature of at least 20°C up to the melting temperature.

39. (previously presented) A process according to claim 38, wherein the mass or perform has a melting temperature of at least 85°C.

40. (previously presented) A process according to claim 39, wherein the mass or perform has a melting temperature of at least 90°C.

41. (previously presented) A process according to claim 38, wherein the core mass or perform has a melting temperature of at most 120°C.

42. (previously presented) A process according to claim 41, wherein the core mass or perform has a melting temperature of at most 110°C.

43. (previously presented) A process according to claim 38, including plastically forming the core mass or perform from a temperature of at least 30°C up to the melting temperature.

44. (previously presented) A process according to claim 43, including plastically forming the core mass or perform from a temperature of at least 50°C up to the melting temperature.

45. (previously presented) A process according to claim 26, wherein the supporting core manufacturing step includes manufacturing the supporting core via press-moulding and shape-forming in a cavity of a press-moulding tool.

46. (previously presented) A process according to claims 45, wherein the press-moulding tool has a multi-part mold.

47. (previously presented) A process according to claim 446, wherein the press-moulding tool has a two-part mold, the supporting core manufacturing step including laying the core mass or perform in the open mould cavity and pressing the core mass or perform by bringing the mould parts together and closing the press moulding tool into the shape of the cavity and thereby giving the supporting core a final shape.

48. (previously presented) A process according to claim 26, including laying the perform into an open two-part press moulding tool which forms a tool cavity, the press moulding tool parts

forming cavity parts and the press moulding tool cavity making up the hollow space in the fibre-reinforced component to be manufactured, further including closing the press moulding tool to press the core-mass or perform by shape forming into the contour of the press moulding tool cavity to give a shaped supporting core.

49. (previously presented) A process according to claim 45, wherein the perform exhibits excess material with respect to the final, shaped supporting core and the excess material flows out of the cavity via openings during the press-mould forming, the cavity containing degassing openings to remove trapped pockets of air during the press-mould forming.

50. (previously presented) A process according to claim 26, further including forming a new perform out of the supporting core material removed by melting and leading the molten material from the supporting core directly into a casting mould for producing a new perform.

Claim 51 (canceled)

52. (currently amended) A process according to claim ~~51~~ 26, wherein the average temperature of the supporting core during the injection of the plastic matrix into the mold deviates by less than $\pm 4^{\circ}\text{C}$ from the average temperature of the core mass or perform during the plastic deformation.

53. (previously presented) A process according to claim 52, wherein the average temperature of the supporting core during the injection of the plastic matrix into the mold deviates by less than $\pm 2^{\circ}\text{C}$ from the average temperature of the core mass or perform during plastic deformation.

54. (previously presented) A process according to claim 45, wherein an average temperature of the supporting core during the injecting of the plastic matrix into the moulding tool corresponds to an average temperature of the core mass or perform during plastic deformation.

55. (previously presented) A process according to claim 26, wherein an average temperature of the supporting core during the injecting of the plastic matrix into the mould is less than 6°C and

more than 0°C higher than the average temperature of the core mass or perform during plastic deformation, and further including heating the supporting core one of during and after the injecting of the plastic matrix so that a thermal volume expansion towards the fibre-composite mass of more than 0% and less than 10% results so that pressure is exerted on the fibre-composite mass which leads to the plastic matrix effectively soaking into the fibre mass.

56. (previously presented) A process according to claim 55, wherein the average temperature of the supporting core during the injecting of the plastic matrix into the mould is less than 4°C higher than the average temperature of the core mass or perform during plastic deformation.

57. (previously presented) A process according to claim 56, wherein the average temperature of the supporting core during the injecting of the plastic matrix into the mould is less than 3°C higher than the average temperature of the core mass or perform during plastic deformation.

58. (previously presented) A process according to claims 55, wherein the average temperature of the supporting core during the injecting of the plastic matrix into the mould is more than 1°C higher than the average temperature of the core mass or perform during plastic deformation.

59. (previously presented) A process according to claim 58, wherein the average temperature of the supporting core during the injecting of the plastic matrix into the mould is more than 2°C higher than the average temperature of the core mass or perform during plastic deformation.

60. (previously presented) A process according to claim 55, wherein the thermal volume expansion towards the fibre-composite mass is more than 1%.

61. (previously presented) A process according to claim 60, wherein the thermal volume expansion towards the fibre-composite mass is less than 5%.

62. (previously presented) A process according to claim 61, wherein the thermal volume expansion towards the fibre-composite mass is less than 2%.

63. (previously presented) A process according to claim 26, including producing the fibre-reinforced component in a resin transfer moulding RTM process and the plastic matrix is of a duromer system, the injecting step including injecting the plastic matrix into a cavity of a multi-part RTM-tool at a temperature of about 60°C, the hardening step including hardening the plastic matrix at a temperature of about 70-80°C, and further including removing the fibre-reinforced component from the mould and tempering the fibre-reinforced component at a temperature of about 90-100°C after removal from the mould, the supporting core being melted out of the fibre-reinforced component during the tempering process.

64. (previously presented) A process according to claim 63, wherein the plastic matrix is of an epoxy resin system.

65. (previously presented) A process according to claim 26, wherein the fibre mass is a pre-formed fibre preform of textile material.

66. (previously presented) A process according to claim 26, wherein the fibre mass is substantially of glass fibres.

67. (currently amended) A process for manufacturing a supporting core for use in manufacturing fibre-reinforced component in a Resin-Transfer-Molding (RTM) process, the process comprising the step of plastically deforming a shape-stable perform so as to form a shaped body that is meltable at a temperature above ambient, the manufacturing step including plastically shape-forming the supporting core out of a perform that is cast in a rough shape of a final supporting core shape, the perform having at least an equal mass with the supporting core being manufactured, and choosing the shape of the perform such that distances that the material flows during plastic deformation are minimized, an average temperature of the core during the plastic deformation and an average temperature of the core during the injection of a plastic matrix during production of the fibre-reinforced component being at least substantially equal, wherein an average temperature of the supporting core during the injection of the plastic matrix into the mold deviates by less than $\pm 6^{\circ}\text{C}$

from an average temperature of the core mass or perform during plastic deformation.

Claim 68 (canceled)

69. (previously presented) A process according to claim 67, including plastically shape-forming the core mass or perform at an average temperature greater than 20°C and less than a melting temperature, the melting temperature being above 50°C.

70. (previously presented) A process according to claim 69, including plastically shape-forming the core mass or perform at an average temperature greater than 35°C.

71. (previously presented) A process according to claim 70, including plastically shape-forming the core mass or perform at an average temperature greater than 50°C.

72. (previously presented) A process according to claim 67, wherein the supporting core contains wax.

73. (previously presented) A process according to claim 72, wherein the wax is one of natural wax, chemically modified wax or synthetic wax.

74. (previously presented) A process according to claim 72, wherein the supporting core is comprised substantially of wax.

75. (previously presented) A process according to claim 69, where in the core mass perform has a melting temperature of at least 75°C and at most 130°C, the core mass or perform being plastically shape-formable from a temperature of at least 20°C up to the melting point.

76. (previously presented) A process according to claim 75, wherein the core mass or perform has a melting temperature of at least 85°C.

77. (previously presented) A process according to claim 76, wherein the core mass or perform has a melting temperature of at least 90°C.

78. (previously presented) A process according to claim 75, wherein the core mass or perform has a melting temperature of at most 120°C.

79. (previously presented) A process according to claim 78, wherein the core mass or perform has a melting temperature of at most 110°C.

80. (previously presented) A process according to claim 75, wherein the core mass or perform is plastically shape-formable from a temperature of at least 30°C.

81. (previously presented) A process according to claim 80, wherein the core mass or perform is plastically shape-formable from a temperature of at least 50°C.

82. (previously presented) A process according to claim 67, including producing the supporting core by press moulding and forming in a cavity of a press moulding tool.

83. (previously presented) A process according to claim 82, wherein the press moulding tool has a multi-part mould.

84. (previously presented) A process according to claim 83, wherein the press moulding tool is a two-part moulding tool, the process including laying the core mass or perform in the open cavity of the tool and bringing together the mould parts and closing the press moulding tool so as to press the core mass or perform into the shape of the cavity and thus give the supporting core a final shape.

85. (previously presented) A process according to claim 67, including laying the perform in an open two-part press moulding tool which forms a tool cavity, the press moulding tool parts forming cavity parts and the press moulding tool cavity making up the hollow space in the fibre-reinforced component to be manufactured, the process further including closing the press-moulding

tool so as to press the perform by shape forming into the contour of the press-moulding tool cavity so as to form the supporting core.

86. (previously presented) A process according to claim 84, including forming the perform so that the perform has, with respect to a final shape of the supporting core, an excess of material which excess material flows, during the plastic deformation, out of the press moulding to a cavity via openings, the press moulding tool cavity having degassing openings for removing trapped pockets of air.

Claims 87-89 (canceled).